UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/778,254	02/07/2001	Leonard Joseph Cimini JR.	2000-0192	6370

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EXAMINER
PEZZLO, JOHN

ART UNIT	PAPER NUMBER
2662	

DATE MAILED: 01/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO 90C (Rev 10/03)

	Application No.	**Applicant(s)**
Office Action Summary	09/778,254	CIMINI ET AL.
	Examiner	**Art Unit**
	John Pezzlo	2662

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>03 September 2004</u>.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-19</u> is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1,2,4,5,11-13,15 and 17</u> is/are rejected.

7)☒ Claim(s) <u>3,6-10,14,16,18 and 19</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All   b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)   4)☐ Interview Summary (PTO-413)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)   Paper No(s)/Mail Date. _____ .
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)   5)☐ Notice of Informal Patent Application (PTO-152)
   Paper No(s)/Mail Date _____ .   6)☐ Other: _____ .

U.S. Patent and Trademark Office

PTOL-326 (Rev. 1-04)   Office Action Summary   Part of Paper No./Mail Date 011205

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

I.   Claims 1, 2, 4, 5, 11-13, 15 and 17 are rejected under 35 U.S.C. 102(b) as being

anticipated by Muller et al. "A Novel Peak Power Reduction Scheme For OFDM" hereinafter

Muller.

1.   Regarding claims 1 and 11 – Muller discloses a method of embedding PAP-reducing

inversion sequences onto transmitted data (transmitting optimized transmit sequences, see

section 4.1),

Muller discloses determining an initial PAP value for a block of symbols (introduce

complex rotation factors with $b\mu$=1, for example see section 4.1),

Muller discloses partitioning the bock of symbols into a predetermined number of

clusters (partitioned into V pairwise disjoint blocks. Since partitioning of the block is one prior to

computation, V is understood to be determined prior to the PAP reduction computation, section

4.1),

Muller discloses selecting a respective phase factor for each of the clusters so as to form

an inversion sequence (optimized transmit sequence) that reduces a PAP of transmitted data

corresponding to the block of symbols (the number set {±1, ±j) are used as phase factors to form

the inversion sequence of each sub-block that has the optimized values, see section 4.1 and 4.3),

Muller discloses embedding the inversion sequence onto the transmitted data by rotating

selected tones in each of the clusters based upon a value of the associated phase factor (Rotation

of all subcarriers in sub-blocks v=(1 ...V) to find the optimum transmit sequence. The sequence

is then embedded and transmitted as shown in figure 1, see elements "bμ (v)" and "peak value

optimization" and section 4.1).

2.   Regarding claim 2 - Muller discloses rotating at least one tone in a first one of the

plurality of clusters when the corresponding phase factor rotates the first one of the plurality of

clusters (all subcarriers in sub-blocks v=(1...V) are rotated, see section 4.1).

3.   Regarding claims 4 and 15 - Muller discloses where the phase factors are binary (Muller's

embodiment does use the values {±1}, section 4.3).

4.   Regarding claims 5 and 17 - Muller discloses detecting the inversion sequence (the set

consisting of all optimum rotation factors has to be transmitted to the receiver so that the

subcarriers can be rotated back appropriately, see section 4.2).

5.   Regarding claim 12 - Muller discloses employing an iterative process to determine the

phase factors (the process goes through a plurality of phase factor values and determines the

optimal value from said plurality of values. It must go through an iterative sequence to determine

that optimal value, see section 4.1).

6.   Regarding claim 13 - Muller discloses approximating an optimal inversion sequence .

(perform a peak value optimization for the transmit signal to result in an optimum transmit

sequence, see section 4.1).

Allowable Subject Matter

Claims 3, 6-10, 14, 16, 18, and 19 are objected to as being dependent upon a rejected

base claim, but would be allowable if rewritten in independent form including all of the

limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed 3 September 2004 have been fully considered but they are

not persuasive. Applicants argue on pages 3 and 4 that Muller fails to teach embedding the

inversion sequence onto the transmitted data. The examiner respectfully disagrees.

Both the invention and the reference are directed to reducing the peak to average power

fluctuations, which occur in an ODFM system. Both the invention and the reference utilize the

same block diagram as shown in Figure 4 of the invention and Figure 1 of the reference. Both the

invention and the reference are directed to determining the values of the vector $b=(b_1...b_m)$ in

Figure 4 of the invention and $b=(b_\mu...b_\mu)$ in Figure 1 of the reference. Hereinafter the vector b.

Both the invention and the reference disclose an iterative process for determining the vector b,

which will reduce the peak to average power fluctuations. Both the invention and the reference

disclose that no side information needs to be transmitted from the transmitter to the receiver,

refer to section 4.2 in Muller.

The applicants argue that Muller does not embed the inversion sequence in the

transmitted data. However, the inversion sequence is the vector b. The vector b as shown in

Figure 4 of the invention and Figure 1 of the reference is used to multiply the signal sequence

(data sequence) and the result is transmitted to the receiver. The invention and the reference

disclose that the elements of vector b can be either +1 (plus one) or –1 (minus one). Therefore,

the result of the multiplication for each of the parallel branches is either, leave the sign of the

signal sequence unchanged or negate the sign of the signal sequence. The inversion sequence

(vector b) is embedded in the transmitted data since the sign modifications are an indication of

the vector b, which caused the resultant sequence.

The examiner would like to add that the invention and the reference depart in how the

receiver determines the vector b not in how the transmitter embeds the inversion sequence

(vector b) into the transmitted result. The receiver in the invention given knowledge a priori

utilizes this information to determine the vector b after demodulation in order to recover the data

sequence.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing

date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure.

1.   Laroia et al. (US 6,301,268 B1) discloses a communication method for FDM signaling

systems with reduces average power requirements.

2.   Bauml et al. (US 6,125,103) discloses a method and device for reducing the crest factor

in digital transmission procedures.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to John Pezzlo whose telephone number is (571) 272-3090. The

examiner can normally be reached on Monday to Friday from 8:30 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Hassan Kizou, can be reached on (571) 272-3088. The fax phone number for the

organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is (571) 272-2600.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C.

or faxed to:

(703) 872-9306

For informal or draft communications, please label "PROPOSED" or "DRAFT"

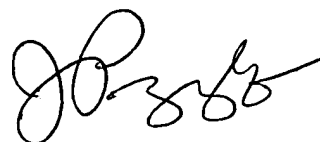Hand delivered responses should be brought to:

Jefferson Building

500 Dulany Street

Alexandria, VA.

John Pezzlo

12 January 2005

JOHN PEZZLO
PRIMARY EXAMINER